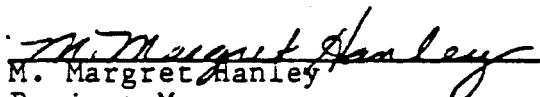


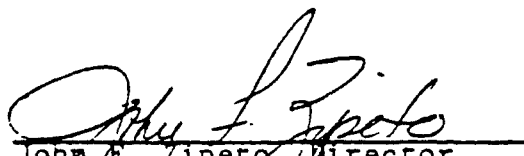
Wells 6+H
11.8
11.82

21E ASSESSMENT OF
J. J. RILEY PROPERTY
228 SALEM STREET
WOBURN, MASSACHUSETTS
April 19, 1985

Submitted to
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Boston, Massachusetts

by
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EXECUTIVE SUMMARY

The objective of this assessment is to provide data for the evaluation of the John J. Riley Co., Inc. property at 228 Salem Street in Woburn, Massachusetts in regards to Massachusetts General Law, Chapter 21E. Information obtained during this assessment has been used to evaluate the site for the presence or absence of hazardous materials. This assessment includes a review of the site history, the hydrologic and geologic setting, identification of the manufacturing process employed at the site, summary of the materials used and the waste generated at the facility, and a summary of the chemical analysis performed on waste and groundwater during previous investigations. No chemical analysis was performed during the present investigation.

Geotechnical Engineers Inc. (GEI) determined that while the John J. Riley Co., Inc. currently uses and has in the past used chemicals which are hazardous, the company does not generate hazardous waste. Additionally, a review of the operating history of the John J. Riley Co., Inc. suggests that only small quantities of hazardous materials used at the site have been discharged to the environment. Finally, previous environmental sampling of soil and groundwater at the site suggests that there is no threat to human health or the environment due to the presence of hazardous material or oil. It is GEI's professional opinion, based on data presented in this report, that environmental conditions at the John J. Riley Co., Inc. site do not warrant further investigative action by the Massachusetts Department of Environmental Quality Engineering.

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1. OBJECTIVE

The objective of this assessment is to provide data for the evaluation of the John J. Riley Co., Inc. property at 228 Salem Street in Woburn, Massachusetts in regards to Massachusetts General Law, Chapter 21E. Information obtained during this assessment has been used to evaluate the site for the presence or absence of hazardous materials. This assessment includes a review of the site history, the hydrologic and geologic setting, identification of the manufacturing process employed at the site, summary of the materials used and the waste generated at the facility, and a summary of the chemical analysis performed on waste and groundwater during previous investigations.

2. SITE LOCATION/DESCRIPTION

The John J. Riley Co., Inc. is located at 228 Salem Street, Woburn, Massachusetts. The site location is shown in Fig. 1, and a plan of the site is shown in Fig. 2. The property is approximately 15.8 acres and is bounded by the following:

- ° Property occupied by Bio Assay Inc. to the north.
- ° The Boston and Maine Railroad right-of-way to the east.
- ° Salem Street to the south.
- ° Wildwood Street to the west.

The base plan for Fig. 2 is from city of Woburn topographic maps. The topographic maps were prepared in 1966 and may therefore be incorrect where excavation and/or filling has been performed. Wildwood Street was added to the map by GEI.

The tannery has been in operation at this location since 1915.

The tanning operation takes place in two large gray, wood-framed buildings (Buildings 1 and 2). Two wood-framed office buildings abut Salem Street south of the tannery buildings. There are several areas and structures which are associated with the tanning operation as follows (refer to Fig. 2):

- ° A hide storage area approximately 170 ft by 300 ft. Hides are stacked on pallets in this area after arriving at the site by truck. The hides have been salt cured before storage in this area. This area is paved.
- ° A drum storage area where empty drums which contained chemicals used in the tanning process are stored awaiting pick-up by a barrel recovery firm. This area is paved. *Whitney?*
- ° A bag house north of Building No. 1 where dust from the buffing of hides is collected. This dust is transferred to a small lagoon just north of the bag house.
- ° A catch basin north of Building 2. Effluent from the tanning operation, containing solid and liquid wastes, enters the catch basin. Solids settle out and the

liquid effluent enters the city of Woburn sewer which connects with the MDC Wilmington trunk sewer main. The sewer runs north from Salem Street between the hide storage area and the catch basin and then northeast under the B&M Railroad.

*Woburn sewer
tested for
EPH?*

- ° An area north of the hide storage area and adjacent to Wildwood Street which has been used in the past to landfill sludge from the catch basin. Sludge was land-filled in this area up until 1975 and was recently excavated and stockpiled nearby awaiting removal from the site. Sludge from the catch basin is now disposed of on the slope between the catch basin and the pump house for Production Wells #1 (PW #1).
- ° An oil-fired power plant north of Building 1. Three 15,000 gallon underground storage tanks are located adjacent to the power plant.
- ° A pump house for Production Well #1 (PW #1) is approximately 300 ft northeast of the catch basin adjacent to the B&M Railroad tracks. PW #1 is operational but is seldom used. A second well, currently used for production water, is located on property owned by Wildwood Conservation Trust approximately 400 ft northeast of PW #1. The second well is called Production Well #2 (PW #2.)

The site is intersected by a Woburn City Sewer easement which extends approximately 600 feet north from Salem Street, and then northeast towards the B&M Railroad easement, where the Woburn City Sewer discharges to the Metropolitan District Commission Wilmington trunk sewer main. The Riley tannery has been discharging effluent into the Woburn City Sewer since approximately 1925.

The land east and north of the John J. Riley Co., Inc. property is zoned for industrial use, and there are numerous small businesses in this area. The properties abutting or close to the Riley property are described below. Previous use of the property is noted where information was available.

Murphy's Waste Oil Service

This property is located east of the Riley property and the B&M Railroad and fronts on Salem Street (No. 252). The primary activity on this property is the collection and storage of waste oil before disposal.

Whitney Barrel Company

This property is located east of Murphy's Waste Oil Service along Salem Street (No. 256). The primary activity on this property is the reclamation of chemical storage drums.

Beatrice Foods Co. (now Wildwood Conservation Land)

This property is located north of Murphy's Waste Oil Service and Whitney Barrel Co., beside B&M Railroad right-of-way. This land is unused except for a water supply well used by the John J. Riley Co., Inc.

Bio Assay, Inc.

This property is located north of the Riley property along Wildwood Street. The primary activity on this property is research and testing concerning animal toxicology.

Lechmere Warehouse

This property is located north of the Bio Assay property, between Wildwood Street and the B&M Railroad right-of-way. The primary activity on this property is the storage of merchandise prior to distribution.

Johnson's Roses

This property is located west of the Riley property and Wildwood Street. The primary activity on this property is the growing of roses.

215 Salem Street

This property is located at the intersection of Wildwood and Salem Streets, south of Salem Street. An office building is located at the rear of the property. This property is the former site of the Murray Leather Co., a leather tannery.

219 Salem Street

This property is located directly across Salem Street from the Riley property. The primary site activity is the storage and sale of concrete forming supplies.

235 Salem Street

This property is located directly across Salem Street from the Riley property. The primary site activity is the sale of banding saws and knives.

The area west of Johnson's Roses is zoned for residential use to the border with the town of Burlington.

3. ENVIRONMENTAL SETTING

The John J. Riley Co., Inc. site is located west and adjacent to the Aberjona River, which has been the subject of investigations performed by or at the direction of the United States Geologic Survey (USGS), the United States Environmental Protection Agency (US EPA), and private property owners. Information regarding the geologic and hydrologic setting of the site presented here is based on information developed during these investigations. A list of the references used during this assessment is presented in Section 8.

3.1 Topography

The topography of the Riley site is generally level over the southern half but slopes gradually to the north to a drainage swale. In the northern half of the site the topography varies. There is a small hill adjacent to the northerly property line which rises to El 113 ft (NGVD). From the vicinity of the catch basin ground surface drops from about El 80 down to about El 55 at PW #1. East of Building 2 ground surface drops from about El 80 adjacent to the building down to El 50 along the B&M Railroad right-of-way. In general, the topography of the site decreases from west to east.

Geology/Hydrology

Surface runoff on the site generally drains to the east. Runoff from the north and south halves of the site drains to the swale which cuts across the site from west to east. It is reported by Mr. John Riley that a stream flows intermittently in the swale.

The Riley site is located approximately one quarter of a mile west of the Aberjona River which is within the Mystic River Drainage Basin. A USGS study (Ref. 8) reports expected well yields of 300 gpm in the area of the site. The aquifer consists of sands and gravels overlying bedrock. Borings performed during YE²ARS investigation in 1983 (Ref. 7) indicate that the subsoils consist of coarse sand, gravel and boulders overlying bedrock. (The location of monitoring wells installed by YE²ARS are identified in Fig. 2.) Based on water levels measured in observation wells installed on the site during YE²ARS investigation, it appears that groundwater flows from west to east over the site. The groundwater level measurements were taken while only Well PW #2 was operating.

The YE²ARS report concluded, however, that based on the results of measurements of drawdown in PW #1 while pumping PW #2, the direction of groundwater flow on the site is not significantly affected by pumping at PW #2. In our opinion, the conclusion appears reasonable based on the available data.

The city of Woburn obtains its drinking water supply from the Metropolitan District Commission (MDC) and Spot Pond. The Aberjona River Valley proximate to the Riley site is designated as a water resource area within the city of Woburn and two high yield production wells (Wells G and H) are situated northeast of the site. Existing information indicates that these wells are located upgradient of the Riley site. The wells were closed in 1978 when volatile organic compounds were detected in water from the wells. The source of the contamination affecting the wells is currently under investigation by the USEPA and their consultant, NUS Corporation.

Groundwater from the Riley Production Well No. 2 (PW #2), which is situated on property owned by the Wildwood Conservation Corporation, is known to contain significant levels of chlorinated volatile organic compounds, many of which have been detected in Woburn Supply Wells located northeast of the Riley tanning site. Groundwater from Production Well No. 1 has exhibited (based on chemical testing completed in 1983) only trace levels of chlorinated volatile organic compounds. The source of the contamination in the Riley wells is unknown. Samples collected by NUS Corporation and Beatrice Foods Corp. during a hydrogeologic investigation of the Wildwood property indicate that soil and groundwater northwest and south of Production Well #2 is contaminated.

Additionally, information obtained by YE²ARS during a hydrogeologic assessment of the Riley site indicates that groundwater migrating west to east from the Riley site contains only trace levels of VOC's and, accordingly, even if drawn toward PW #2 is not a probable source of contamination in PW #2.

4. MATERIALS/WASTE ASSOCIATED WITH TANNING PROCESS

The John J. Riley Co., Inc. is a medium-sized, chrome cowhide leather tannery. The principal product is leather for footwear.

The John J. Riley Co., Inc. is not an EPA generator of hazardous material nor does the facility require a Resource Conservation Recovery Act (RCRA) permit for the storage or handling of hazardous material. The facility does use small quantities of materials which are considered hazardous by US EPA and DEQE, however. The materials include:

Chromium: The tannery uses a chromium tanning process. This involves converting hexavalent chromium (Cr^{+6}) which is an EPA hazardous substance into trivalent chromium (Cr^{+3}) which is not a hazardous material. Only the trivalent chromium is introduced into the actual tanning process. Waste streams generated during the tanning process do not, therefore, contain Cr^{+6} and are not considered hazardous by US EPA or DEQE.

Solvents: Solvents are used at the facility in the application of lacquers and finish coatings to the tanned hides. These solvents include:

- Butyl Acetate
- Butoxyethanol
- Diisobutyl ketone
- Methoxyethanol

The solvents are used as a carrying medium for lacquers and finishes which are applied directly to finished hides. Waste solvent is not generated during this process since residual solvents will vaporize upon application. Of the solvents listed above, only butyl acetate is identified as an EPA hazardous substance. This designation is due to the flammability of the solvent. No water quality standard for butyl acetate has been established, and the compound is not an EPA hazardous waste.

Finally, small quantities (less than 1 gallon/year) of the chlorinated solvent 1,1,1, trichloroethane were used at the facility prior to 1979 to clean one embossing plate.

Benzidine Dye: Benzidine based dyes were used by the John J. Riley Co., Inc. until the mid-1960's. Water used to wash dyed hides was discharged to the catch basin. Solids, which settled out of the wash water, were piped to lagoons at the northwest portion of the site and the effluent was

discharged to the sewer. It is expected, therefore, that trace concentrations of benzidine dye were present in sewer effluent and may be present in solids which were landfilled on the site.

Disinfectants: According to employees at the Riley facility, the commercial product Dizene™, which contains orthodichlorobenzene, was used as a disinfectant in the hide wash water from about 1972 to 1982. Dizene™ which is an antiseptic/disinfectant, was used on weekends and during plant shutdowns when the hides would be soaked over a longer period of time. Dizene™ diluted with water was also used as a disinfectant and deodorizer in the floor drains. It is estimated that 1100-2200 lbs of Dizene™ were used annually between 1979 and 1982 at the Riley facility. Dizene™ introduced to the washwater and floor drains is expected to have discharged to the sanitary sewer. Sediments settled from wash water and landfilled at the northwest corner of the site may contain trace concentrations of Dizene™, or the constituents of Dizene™, including orthodichlorobenzene. Orthodichlorobenzene is an EPA hazardous substance.

Fuel Oil: The Riley tannery maintains a power plant which consists of two boilers with a maximum output potential of 25,000 lbs of steam per hour. The boilers are fueled by No. 3 Bunker C. fuel oil, which is stored in three 15,000 gallon underground storage tanks situated north of the machine shop and west of the boiler room. These tanks were installed in 1981, to replace the original tanks used at the facility. Oil is considered a regulated material according to Massachusetts General Law, Chapter 21E.

In addition to the material described above, the John J. Riley Co., Inc. generates solid and liquid waste which is not considered a hazardous material. These wastes include:

Process Effluent: The tannery process may generate 350,000 - 400,000 gallons of waste water per day. Waste water is discharged to a catch basin located north of Building No. 2. Solids are permitted to settle out of the waste water and the liquid fraction is discharged to the Woburn City Sewer System.

Effluent which is discharged to the sewer system is monitored by the Metropolitan District Commission. The John J. Riley tannery is currently operating under a voluntary consent decree with the MDC to upgrade the waste treatment system at the facility.

Sewage Sludge: Solids which accumulate in the catch basin are dredged periodically and landfilled on site. This

landfilling activity has been observed by DEQE. Currently, sludge which is disposed of on the slope between the settling basin consists of soluble and insoluble hide material, hair, blood, dirt, manure, salt, lime, chromium hydroxide, and ferrous hydroxide. Representative samples of sludge which has been landfilled on the site have been analyzed using the EPA EP toxicity test. The sludge was determined to contain acceptable limits of hexavalent and total chromium, as established by EPA and DEQE. The sludge is not identified by EPA or DEQE as a hazardous waste.

Buffing Dust: Dust from the buffing room is collected in a bag house located adjacent to Building No. 1 and is disposed of in a small lagoon situated next to the bag house. Buffing dust is a particulate waste composed of fine shavings from the finished hides. According to EPA and DEQE, it is not a hazardous waste.

Steel Drums: Some of the raw material used at the tannery is delivered in 55-gallon steel drums. Empty drums are stored on site for short periods of the time until they are sent to the barrel reclamation firm in Woburn.

Leather Trimmings: Scrap leather is sold to other manufacturing companies.

Miscellaneous Trash: Trash generated at the John J. Riley Co., Inc. is either incinerated on site or removed from the site by a private trash collecting company.

Scrap Metal: Scrap metal is sent to the Stoneham Trading Company for reclamation.

5. SUMMARY OF PREVIOUS CHEMICAL ANALYSIS

5.1 Description of Chemicals Potentially Present On Site

Based on information presented in Section 4, hazardous chemicals or waste which are potentially present on the site as a result of waste management practices employed by the John J. Riley Co., Inc. include:

Benzidine: Residual benzidine dye may potentially be present in sewage sludges landfilled at various locations on the site. The benzidine would originate from solids precipitated out of wash water used to rinse dyed hides. Benzidine is a base/neutral organic compound and is a recognized human carcinogen. It is identified by EPA as a hazardous waste and priority toxic pollutant. No regulatory standards exist for permissible concentrations of benzidine in soil. The EPA Recommended concentrations in water to protect human health is zero. The criteria for an increased cancer risk of one in 100,000 is 1.2 nanograms per liter (ng/l) (USEPA, Benzidine: Ambient Water Quality Criteria, Washington, DC, 1980).

Orthodichlorobenzene: Orthodichlorobenzene is an active ingredient of the disinfectant "Dizene", which was used in rinse water at the tannery. Although it is likely that the orthodichlorobenzene, which is relatively soluble, remained in the rinse water and was carried from the facility in wash water, it is possible that trace concentrations of orthodichlorobenzene adsorbed to solids in the catch basin and is present in sludges which were landfilled on the site. Dichlorobenzene is considered an EPA Hazardous Substance, Hazardous Waste and Priority Pollutant. The EPA Health Advisory for chronic exposure of dichlorobenzene in drinking water is 134 micrograms per liter (ug/l) or parts per billion (ppb).

5.2 Groundwater Analysis Performed on and Adjacent to the Riley Tanning Site

5.2.1 Groundwater Samples

As part of the US EPA investigation of groundwater contamination in Woburn, samples of groundwater from Riley Production Well No. 1 (PW #1) were obtained and tested for priority pollutants which included volatile organics and base/neutral organic compounds. In addition, groundwater samples were obtained from four monitoring wells and PW #1 during YE²ARS investigation in October, 1983. These samples were analyzed only for the presence of volatile organics according to EPA Method

601. The results of the analyses of groundwater samples obtained on the Riley property are summarized in Table 2. The results are also summarized on Fig. 3 at the locations where the samples were obtained.

Volatile organic contaminants were detected in four of the five groundwater samples analysis reported in Table 1. The most significant levels of volatile organic contaminants were detected at PW #1 in 1980.

The contaminants detected at PW #1 have also been detected at Riley PW #2, which is situated approximately 400 feet northeast of PW #1. The relationship between contaminants detected in both the Riley Production Wells and the contaminants detected in Woburn Wells G and H is currently under investigation by US EPA's subcontractor NUS Corporation.

The most recent analysis of water from PW #1 (October, 1983) indicated the presence of only two volatile organic compounds: 1,2 transdichloroethene and trichloroethene, at concentrations less than 1 ppb, which is below the reporting limit for the analysis performed. Neither of these compounds are reported to have been used or disposed of on the Riley site.

Three volatile organic compounds were reported to be present in three of the four monitoring wells installed on the Riley tanning site by YE²ARS.

Chloroform was detected in B-4 and B-5, the locations of which are shown in Figs. 2 and 3. Chloroform, which is a trihalo methane, is a common contaminant in drinking water supplies as a result of chlorination. The DEQE has set a Regulatory Standard for permissible concentrations of trihalomethanes of 100 ug/l (ppb). The concentration of chloroform in water sampled at the Riley site ranged between .8 and 1.7 ppb which is below the DEQE's drinking water standard for that class of chemical contaminants.

Chlorobenzene was detected in water sampled from B-2 at a concentration of 2.3 ppb and at B-4 at 20 ppb. The source of the chlorobenzene is not known. It is possible, however, that chlorobenzene is occurring as a degradation product of orthodichlorobenzene or was present as a contaminant in the orthodichlorobenzene products used at the site. The maximum concentration of chlorobenzene detected is below the recommended permissible concentration in water to protect human health,

which is 488 ug/l (ppb). Groundwater contour elevations for the site indicate that B-4 is the most upgradient well at the site. This suggests that contaminants present at B-4 may result from contamination migrating on to the site from west of Wildwood Street. Existing data are insufficient to demonstrate this however. Chlorobenzene was not detected in B-1 or PW #1 when sampled by YE²ARS in 1983. The absence of the contaminants in these wells, which are downgradient from B-4 and B-2, suggests that chlorobenzene is not migrating off of the Riley property.

1,2 trans dichloroethene (Also referred to as 1,2 dichloroethylene) was detected in groundwater in trace concentrations (.7 ppb) at B-2. The source of the contaminant, which is an EPA priority toxic pollutant, is unknown. An EPA Health Advisory for 1,2 trans dichloroethene in water to protect human health has not been established due to insufficient data. 1,2 trans dichloroethene was also detected in trace concentrations (.4 ppb) in water from PW#1.

A complete analysis for EPA Priority Pollutants was performed on water from PW #1 by Ecology & Environment (E&E) in 1980. This is the only analysis performed which would detect benzidine in water at or adjacent to the Riley site. The compound was not detected in the sample collected by E&E. Since PW #1 is downgradient of the Riley site, it is probable that contaminants migrating from the Riley site would be detected in this well. The lack of benzidine in groundwater at this location suggests that benzidine is not present as a contaminant at this time in groundwater migrating from the Riley tanning site to the Aberjona River Valley.

5.2.2 Sludge Samples

EP toxicity analyses of the sludge landfilled on the Riley property, were performed during YE²ARS investigation in July 1983. The results of the EP toxicity tests are summarized in Table 2. In May 1982, samples of the landfilled sludge were obtained by personnel from the John J. Riley Co., Inc., sent to a DEQE approved laboratory, and analyzed for volatile organic chemicals. The results are summarized in Table 3.

The results of EP toxicity tests and volatile organic analysis, reported in Tables 2 and 3, indicate that sludges landfilled at the site do not exhibit characteristics which would cause the waste to be identified

as a hazardous waste. The analysis would not detect benzidine in the sludges. However, no regulatory standard for permissible concentrations of benzidine have been established by DEQE or EPA.

6. CONCLUSIONS

In our professional opinion, based on our review of the available information and data presented in this report, we make the following conclusions regarding the 21E assessment of the John J. Riley Co., Inc. property:

1. The John J. Riley Co., Inc. site is occupied by a chrome tanning facility which uses or has used hazardous material and/or potentially hazardous material and oil in a tanning process. These materials include hexavalent chrome, nonchlorinated polar solvents, benzidine-based dyes, and disinfectant which contained orthodichlorobenzene. The J. J. Riley Tanning company is not a generator of hazardous waste, however, according to US EPA and DEQE.
2. Evaluation of waste management practices employed at the John J. Riley Co., Inc. suggests that trace concentrations of benzidine and orthodichlorobenzene may have been introduced to the environment via the land-filling of sewage sludges on the site.
3. Groundwater sampling from wells installed on the Riley tanning site by YE²ARS in 1983 revealed trace concentrations (less than 20 ppb) of volatile organic compounds. The source of these contaminants is unknown. It is possible, however, that one of the compounds, chlorobenzene, is present as a result of the degradation of orthodichlorobenzene, which was present in a disinfectant used at the tannery.
4. The concentrations of volatile organic compounds detected are small and are below the recommended permissible concentration in water to protect human health or current EPA Health Advisories for all of the compounds except 1,2,trans dichloroethene. No permissible concentration or SNARL has been set by EPA or DEQE for 1,2,trans dichloroethene due to insufficient data.
5. The most recent analysis of water from Riley PW #1 indicates that groundwater at that

location contains only trace concentrations (less than 1 ppb) of two volatile organic compounds. One of these compounds, 1,2,trans dichloroethene, has been detected on the Riley site at a concentration of less than 1 ppb.

6. Riley Production Well #1 was sampled for US EPA priority toxic pollutants by Ecology & Environment Inc. (E&E) 1980. US EPA priority toxic pollutants include benzidine, which may be present in sludges landfilled at the site. Benzidine was not detected in groundwater from PW #1, sampled by E&E.
7. Groundwater contours measured by YE²ARS in 1983 indicate that groundwater on the Riley site flows west to east toward the Aberjona River. Therefore, PW #1 and B-1 represent the most downgradient wells on the Riley site. The absence of chlorinated volatile organic compounds in B-1, the presence of only trace concentrations of chlorinated organics, and the absence of benzidine in PW #1 suggests that groundwater migrating from the John J. Riley Co., Inc. site is not a probable source of the groundwater contamination present within the Aberjona River Valley.
8. Sampling of landfilled sludge at the Riley tanning site for EP toxicity characteristics and volatile organics indicate that sludge at the site does not exhibit those characteristics of hazardous waste, according to US EPA and DEQE. Although the sludge has not been analyzed specifically for nonvolatile organic compounds, including benzidine, we note that no standards or permissible concentration for solid waste have been established.
9. Significant levels of volatile organic contamination have been detected in groundwater on land east of the Riley tanning site, including land presently owned by Wildwood Conservation Corporation and in the City of Woburn Supply Wells G and H, situated northeast of the site. Data developed during previous investigations at the J. J. Riley Tanning site (YE²ARS, 1983) and by EPA and

DEQE indicate that the John J. Riley Co., Inc. site is not a probable source of the contamination detected east of the site. Additionally, Wells G and H, which are currently under investigation by EPA's consultant, NUS Corporation, are known to be located upgradient of the Riley tanning site.

10. As in all 21E site assessments, the information presented in this report is not sufficient to guarantee the presence or absence of hazardous waste or oil at the John J. Riley Co., Inc. Based on our analysis of the data presented in this report, however, it is GEI's opinion that conditions at the site do not suggest that a threat to human health or the environment currently exists at the site, nor does it indicate the need for further investigative action by DEQE.

7. LIMITATIONS

The conclusions contained in this report are based on the information described in this report. Information concerning chemicals used by the John J. Riley Co., Inc. was provided by personnel at the John J. Riley Co., Inc.. No new chemical laboratory testing was performed as part of this study. The conclusions provided by GEI in this report are based solely on the information reported in this document. Should additional chemical testing information become available, GEI will review it to confirm or modify conclusions presented in this report.

This environmental assessment and report was prepared by GEI for the use of the law firm of Nutter, McClennen and Fish, exclusively. However, if authorized by Nutter, McClennen & Fish, GEI acknowledges and agrees that this report may be used by said firm in the course of its representation of John J. Riley Co., Inc. and may be delivered to potential lenders, title insurers, purchasers and tenants.

This report has been prepared in accordance with generally accepted engineering practices as stated in our Standard Conditions for Engagement dated July 1, 1984 contained in Appendix A. No other warranty, expressed or implied, is made.

8. LIST OF REFERENCES

1. "Site Inspection Report of John J. Riley Company, December 1, 1980," Ecology and Environment.
2. "Inventory and Analysis of Existing Well Data for East and North Woburn, MA, January 9, 1981," Ecology and Environment, Inc.
3. "Interim Report on the Geology and Groundwater of North and East Woburn, April 3, 1981," Ecology and Environment, Inc.
4. "Interim Report on the Groundwater Quality of East and North Woburn, MA, May 6, 1981," Ecology and Environment, Inc.
5. "Chlorinated Solvent Contamination of the Groundwater, East Central Woburn, MA, March 8, 1982," Ecology and Environment, Inc.
6. "Evaluation of the Hydrogeology and Groundwater Quality of East and North Woburn, MA, Volume I, Final Report, June 25, 1982," Ecology and Environment, Inc.
7. "Hydrogeologic Investigation of the John J. Riley Tanning Co., Inc., 1983," Yankee Environmental Engineering and Research Services, Inc.
8. "Hydrology and Water Resources of the Coastal Drainage Basins of Northeastern, Massachusetts, from Castle Neck River, Ipswich, to Mystic River, Boston, 1980," Department of the Interior, United States Geological Survey.

TABLE 1 - CONTAMINANTS FOUND IN GROUNDWATER
 SAMPLES FROM J.J. RILEY TANNING CO. PROPERTY
 21E ASSESSMENT
 J.J. RILEY TANNING CO.

Compound	Concentration, ppb					
	PW #1		B-1	B-2	B-4	B-5
	<u>A</u>	<u>D</u>	<u>D</u>	<u>D</u>	<u>D</u>	<u>D</u>
1,1,1 trichloroethane	28	ND	ND	ND	ND	ND
1,2 trans dichloroethene	12	0.4	ND	0.7	ND	ND
trichloroethene	53	0.4	ND	ND	ND	ND
chlorobenzene	10	ND	ND	2.3	20	ND
chloroform	ND	ND	ND	ND	1.7	0.8

Notes:

1. Key to sampling:

- A. Samples collected by Ecology and Environment, Inc. between November 12, 1980 and March 2, 1980. ND indicates compound not present at or above the unspecified method detection limit.
- D. Samples collected by YE²ARS on October 12, 1983. ND indicates compound not present at or above the method detection limit of 0.1 ppb.

Geotechnical Engineers Inc.

Project 84442
 April 19, 1985

TABLE 2 - RESULTS OF EP TOXICITY ANALYSES ON
SAMPLES OF LANDFILLED SLUDGE
21E ASSESSMENT
J.J. RILEY TANNING CO.

<u>Constituent</u>	<u>Concentration in ppm</u>				<u>Detection Limit</u>
	<u>Sample 0</u>	<u>Sample N(2)</u>	<u>Sample B</u>		
METALS					
As	ND		ND	ND	0.005
Ba	ND		ND	ND	0.1
Cd	ND	0.008	ND	ND	0.005
Cr (total)	0.35		ND	0.27	0.1
Cr (hexavalent)	0.17			ND	0.1
Pb	0.10	0.11	.11	1.2	(5)
Hg	ND	ND	ND	ND	0.002
Se	ND	ND	ND	ND	0.005
Ag	ND	ND	ND	ND	0.01
Cyanide (ppm, wet weight)	0.66	6.5		--	(5)
Sulfide (ppm, wet weight)	ND	ND		--	5

NOTES:

- 1) Results reported in YE²ARS Report (Ref. 7)
- 2) Duplicate analyses
- 3) Sample locations as follows:
O Old Lagoons
N Slope northeast of Catch Basin
B Buff Dust Lagoon
- 4) ND indicates not present at or above the method detection limit.
- 5) Detection limit not specified in referenced report.

Geotechnical Engineers Inc.

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TABLE 3 - RESULTS OF ORGANIC ANALYSES OF
LANDFILLED SLUDGE
21E ASSESSMENT
J.J. RILEY TANNING CO.

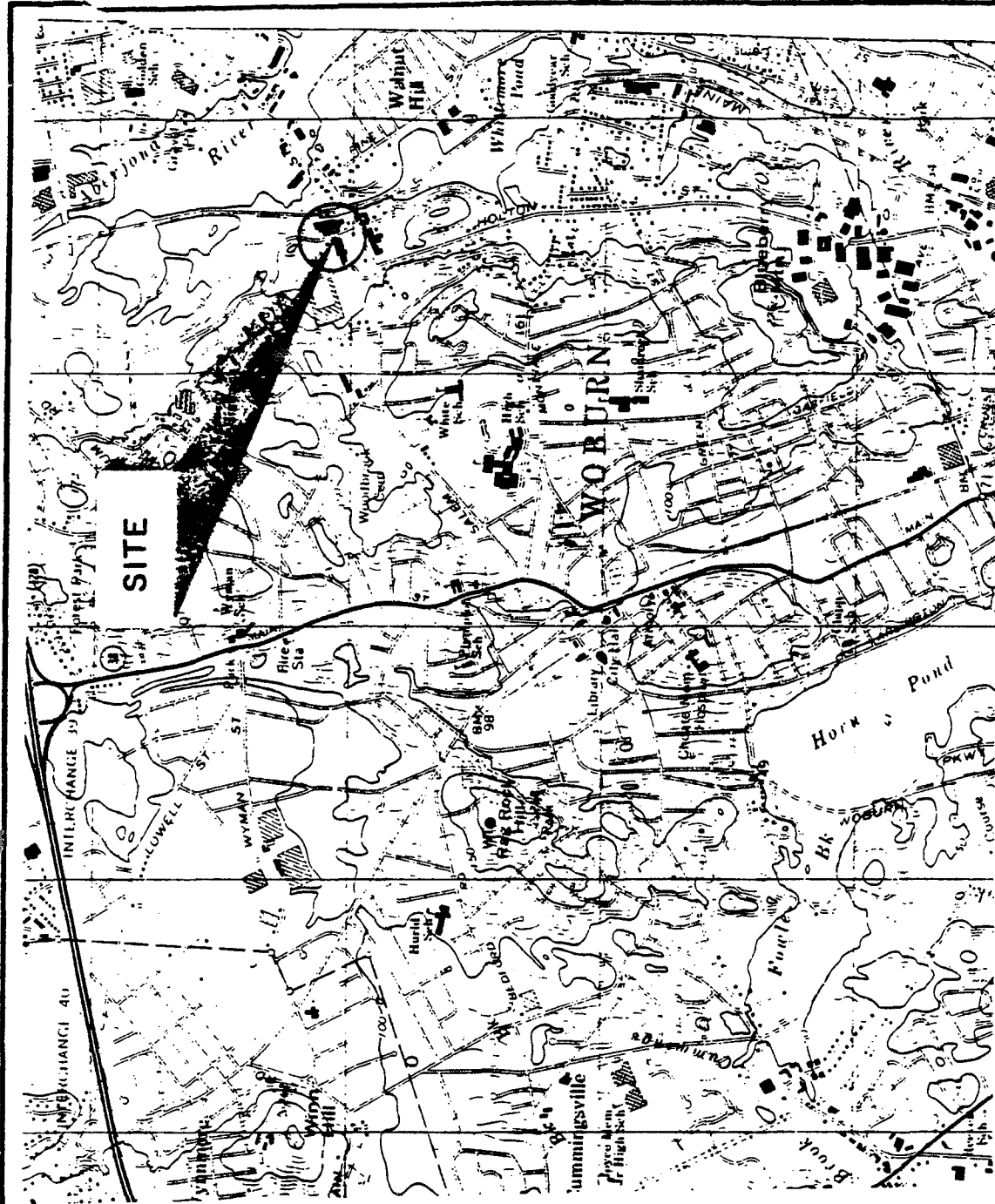
<u>Organic Chemical</u>	<u>Concentration (ppm)</u>		
	<u>Old Lagoons</u>	<u>Sample from Slope North of Catch Basin</u>	<u>Detection Limit</u>
Chloroform	ND	ND	0.05
Trichloroethane	ND	ND	0.005
Dichloroethylene	ND	ND	0.5
Trichloroethylene	ND	ND	0.01
Tetrachloroethylene	ND	ND	0.005
Benzene	ND	ND	0.1

NOTES:

1. Samples obtained May 27, 1982 by J.J. Riley Tanning Co. personnel. ND indicates compound not present at or above the method detection limit.

Geotechnical Engineers Inc.

Project 84442
April 19, 1985



<p>J.J. Riley Tanning Co. Woburn, Massachusetts</p>	<p>21E Assessment 228 Salem Street Woburn, Massachusetts</p>	<p>SITE LOCATION</p>
<p>Φ GEOTECHNICAL ENGINEERS INC. WINCHESTER • MASSACHUSETTS</p>	<p>Project 84442</p>	<p>March 22, 1985 Fig. 1</p>



GEOTECHNICAL ENGINEERS, INC.
STANDARD CONDITIONS FOR ENGAGEMENT
June 30, 1985

COMPENSATION FOR ENGINEERING SERVICES — Fees for engineering services will be based upon the time worked on a given project. They are computed by multiplying total payroll cost time 2.4 for all members of the staff. Total payroll cost is defined as direct salary cost plus payroll taxes and fringe benefits. Clients are advised that all salaries are subject to increases.

Invoices will show certification as to payroll cost as follows: "This is to certify that I have examined this invoice and the accompanying documents and that the services have been rendered as stated."

Fees for providing expert testimony are available on request. Laboratory testing will be done on an hourly basis using the above fee schedule or on a unit price basis, depending on the nature of testing. A fee will be charged for the use of specialized laboratory and field equipment.

This fee schedule is valid until June 28, 1986.

TRANSPORTATION AND SUBSISTENCE — Time spent in either local or intercity travel, when travel is in the interest of the work, will be charged for in accordance with the foregoing rate schedule. For travel by public carrier, a maximum of eight hours per day will be charged.

Automobile expenses for personal or office cars will be charged at a rate of \$0.27 per mile plus tolls and parking charges. Per diem of personnel on assignment outside the Boston metropolitan area will be negotiated for each project. For assignments away from Winchester, Mass., personnel will be permitted to return home for one weekend every three weeks at the client's expense.

FIELD EXPLORATION — We will engage a reputable contractor to perform borings or other exploration. The contractor's charges plus a 10% service charge will be added to our fee. Alternatively, the client may enter into a direct contract with the contractor, in which case invoices for the contractor's services will be mailed directly to the client following our review and approval.

OTHER EXPENSES — Expenses will be billed at our cost plus a 10% service charge. Examples of expenses ordinarily charged to projects are printing and reproduction, shipping charges for soil and rock samples, rental vehicles, fares of public carriers, special fees, insurance, permits, and licenses.

RIGHT OF ENTRY — Unless otherwise agreed, the client will furnish right-of-entry on the land for us to make planned borings and other exploration. We will take reasonable precautions to minimize damage to the land from use of equipment, but have not included in our fee the cost for restoration of damage that may result from our operations. If we are required to restore the land to its former condition, this will be accomplished, and the cost will be added to our fee or to the fee of the contractor engaged to carry out field operations.

SOIL AND ROCK SAMPLES — After submitting our final report on each engagement, we will deliver to the client all cores and samples not consumed in testing, or will dispose of them as directed. Alternatively, we will undertake, when requested, to store the samples for a maximum period of one year. A fee will be charged for storing samples more than one year.

INVOICES — Invoices will be submitted monthly and are payable within 30 days from date of invoice.

INSURANCES — We are protected by Workmen's Compensation Insurance (and/or employer's liability insurance) and by Standard Public Liability Insurance. We will furnish certification upon written request.

PROFESSIONAL LIABILITY — The client will agree to limit our liability, and require a like limitation from any contractor or subcontractor who performs work for which we have provided reports, plans and specifications, to an amount of \$50,000 or our fee, whichever is greater.

We do not accept responsibility for the design of a foundation, substructure, embankment, excavation or other structure, earthwork or construction unless our engagement includes review of the working drawings, specifications and other documents, including site visits during construction in order to ascertain that, in general, the work is being performed in compliance with the contract documents.

On request, we will provide personnel to observe construction in order to ascertain that it is being performed, in general, in accordance with the plans and specifications. This does not make us a guarantor of the contractor's work, and he will continue to be responsible for the accuracy and adequacy of all construction performed. In accordance with generally accepted practice, the contractor will be solely responsible for the methods of construction, direction of personnel and control of machinery, falsework, scaffolding, or other temporary construction aids. In addition, all matters related to safety in, on or about the job site will be under the direction and control of the contractor and we will have no responsibility in that regard. We cannot verify any part of the work performed unless measurements, readings and observations of that part of the construction are made by our personnel.

WARRANTY — Our professional services will be performed in accordance with generally accepted engineering practices. This warranty is in lieu of all other warranties expressed or implied.